

distance between cross sections was determined along the thalweg from National Oceanic and Atmospheric Administration Nautical Chart 11534 (U.S. Department of Commerce, 1983).

### Simulation of Water Discharge

Measured discharge for a complete tidal cycle was used to calibrate the model for the four combinations of boundary conditions. The Myrtlewood-to-Briarcliffe model and the Highway 544, Myrtlewood, and Highway 9 models are described below in detail.

A comparison of measured and simulated discharges from 5:00 a.m. to 6:00 p.m. on March 19, 1982 for the Myrtlewood-to-Briarcliffe boundary conditions, is shown in figure 6. Simulated discharges compare favorably with measured discharges. The simulated discharges range from 4,350 ft<sup>3</sup>/s to -748 ft<sup>3</sup>/s, whereas the measured discharges range from 4,280 ft<sup>3</sup>/s to -558 ft<sup>3</sup>/s. The mean simulated discharge is 3.0 percent greater than the mean measured discharge. The phase of the simulated discharge is approximately 15 to 30 minutes ahead of the measured discharge.

In model calibration for the Myrtlewood-to-Briarcliffe boundary conditions, the best agreement between simulated and measured discharges was obtained using a friction-resistance coefficient of 0.024. This value compares favorably with the resistance coefficient of 0.026 estimated based on field observation of channel conditions. The simulations were performed with a 15-minute time step and a value of 1.00 for the discretization weighting factors. The convergence criterion of 15 ft<sup>3</sup>/s was satisfied in an average of four iterations.

The Myrtlewood-to-Briarcliffe model was verified using measured discharge data from 7:00 a.m. to 4:15 p.m. on October 16, 1981. A comparison of measured and simulated discharges for October 16 is shown in figure 7. The simulated discharges range from 4,450 ft<sup>3</sup>/s to -5,910 ft<sup>3</sup>/s; whereas, the measured discharges range from 4,360 ft<sup>3</sup>/s to -6,050 ft<sup>3</sup>/s. The mean simulated discharge was 2.7 percent less than the mean measured discharge.

The calibrated and verified model was used to simulate the daily mean discharge at the Briarcliffe Acres gage for the period October 1981 to October 14, 1982. The results of the simulation are shown in table 4.

Flow records were computed after October 14, 1982, using three combinations of boundary conditions at Highway 544, Myrtlewood Golf Course, and Highway 9. A wider range of five discharge measurements used to calibrate the model for these boundary conditions showed that the model could not define discharges as accurately as indicated by the 1981 and 1982 measurements, particularly in the range of discharges from -2,000 ft<sup>3</sup>/s to +2,000 ft<sup>3</sup>/s.

Although the model could have been calibrated to fit any one measurement closely, the calibrations could not be verified with the same accuracy by the other measurements. A close calibration for a single measurement adjusts for specific conditions of the single measurement, such as wind, high or low tides or fresh-water inflow, complexity of the tide-stage waves